

DEC 13 2006

REMARKS

Favorable reconsideration of this application is respectfully requested in view of the above amendments and following remarks. Claims 1, 6-8, and 11-14 are amended and supported, for example in the original claims and in Applicants' disclosure. Claims 2-5, 10, and 15-23 are canceled without prejudice or disclaimer. Claim 24 is added and supported for example at page 6, lines 6-18. No new matter has been added. Claims 1, 6-9, 11-14, and 24 are pending.

Applicants appreciate the Examiner's acknowledgment of Applicants' claim for priority. However, Applicants note that the claim for priority is acknowledged in the body of the Office Action (in the Detailed Action portion of the paper), rather than on the Office Action Summary (PTOL-326), as the proper boxes were left unchecked in this form. Applicants respectfully request that the Examiner acknowledge the claim for priority on this form and return the same to Applicants' representative.

Claims 3, 4, 6, 8, and 11-14 are objected to for informalities. Claims 3 and 4 have been canceled, rendering the objection no longer applicable to these claims. Claim 1, which includes the features of canceled claims 3 and 4, has been written to address the issues raised with respect to previous claims 3 and 4. Claims 6, 8, and 11-14 are amended as suggested in the Office Action. Thus, Applicants respectfully submit that the claims are no longer objectionable.

Withdrawal of the objection is respectfully requested.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Applicants respectfully traverse this rejection to the extent it is maintained.

Claim 1 has been amended to recite "a first step of introducing the protein solution into a column filled with a packing agent, the packing agent holding the target protein." Claims 2 and 3 are canceled, rendering the rejection no longer applicable to these claims. Claim 7 has been revised from "cholate" to "sodium cholate." Claim 12 has been revised to remove the language "the protein active against glucose." Thus, Applicants respectfully submit that the claims are definite.

Favorable reconsideration and withdrawal of the rejection are respectfully requested.

Claims 1-14 are rejected under 35 U.S.C. 112, first paragraph, as not being sufficiently described by the specification to convey to one of skill in the art that Applicants were in possession of the claimed invention. Claims 1-14 are also rejected under 35 U.S.C. 112, first paragraph, for lacking enablement. Applicants respectfully traverse these rejections to the extent they are maintained.

The written description rejection contends that the specification fails to demonstrate that Applicants were in possession of the full scope of proteins to be treated as claimed. The enablement rejection contends that the claims are not enabled for the full scope of the proteins to be treated and the liquid chromatography or ion exchange technique.

Applicants respectfully request that the rejections be withdrawn, because claim 1 is commensurate in scope with the disclosure, and is enabled by the specification. Particularly, claim 1 requires the limitations that the target protein is glucose dehydrogenase derived from a microorganism belonging to the genus Burkholderia. The glucose dehydrogenase recites specific structures, namely requiring α , β , γ subunits. (See for example page 6, lines 4-9.) Applicants' specification describes these subunit structures, such that the α subunit of the glucose dehydrogenase is a portion that provides the glucose dehydrogenation enzyme activity, while the γ subunit can also provide such enzyme activity in combination with the α subunit. (See for example page 6, lines 10-18.) Furthermore, the β subunit of the glucose dehydrogenase is a portion that provides the electron transfer activity. (See page 6, lines 4-9.) Claims 6, 12, and added claim 24 have been amended or drafted to be consistent with amended claim 1.

With regard to the liquid chromatography technique, claim 1 requires that the column is filled with a packing agent, where the packing agent is an ion-exchange resin containing a quaternary ammonium group as an ion-exchange group. (See for example page 4, lines 1-4.)

Applicants respectfully submit that the claims are commensurate in scope with the disclosure, and are enabled by the specification. Applicants are not conceding the correctness of the rejections for the original claims.

Claims 1, 4, and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by O'Riordan et al. (US 5939536). Claims 1-5 and 7-9 also are rejected under 35 U.S.C.

102(b) as being anticipated by Shimomura et al. (Anal biochem 1986 vol 153, pp 126-131) and Imai et al. (J. biochem 1976, vol 80, pp 267-76). Applicants respectfully traverse these rejections to the extent they are maintained.

Claim 1 is a method for purifying a target protein from a protein solution containing the target protein by using liquid chromatography. Claim 1 requires the combination of a specific protein solution, a specific packing agent, and a specific eluent. The specific protein solution includes a target protein, where the target protein is glucose dehydrogenase derived from a microorganism belonging to the genus Burkholderia and requires α , β , γ subunits. The specific packing agent is an ion-exchange resin containing a quaternary ammonium group, and the specific eluent contains a hydroxy-cholate.

O'Riordan, Shimomura et al., and Imai et al. fail to disclose or suggest the combination required by claim 1. O'Riordan discloses purification of membrane associated proteins using, for example, ion-exchange chromatography using eluent containing cholate. Shimomura et al. discloses purification of cytochrome bc using detergent exchange chromatography using phenyl-Sepharose and further purification using ion-exchange chromatography on a DEAE-sepharose column. Shimomura et al. also discloses using an eluent containing cholate. Imai et al. discloses purification of cytochrome P450 using an eluent containing cholate. The cited references, however, do not disclose or suggest, for example, the specific glucose hydrogenase and the specific ion-exchange resin, required by claim 1. Thus, claim 1 and its dependents are allowable over the references cited for at least the foregoing reasons.

Reconsideration and withdrawal of the rejections are respectfully requested.

Claims 6 and 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimomura et al. (above) in view of Inose et al. (Biochimica biophysica acta 2003, 133-138). Applicants respectfully traverse this rejection to the extent it is maintained.

Shimomura et al. has been distinguished, and Applicants respectfully submit that Inose et al. does not remedy the deficiencies of Shimomura et al.

Reconsideration and withdrawal of the rejection are respectfully requested.


In view of the above amendments and remarks, Applicants believe that the pending claims are in a condition for allowance. Favorable consideration in the form of a Notice of Allowance is respectfully solicited. If any questions arise regarding this communication, the Examiner is invited to contact Applicants' representative listed below.



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Respectfully submitted,

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